Newsletter of the National Biological Information Infrastructure

nbii Access

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NBII and State Fish and Wildlife Agencies — Working Together

State fish and wildlife agencies are commonly believed to be among the nation's largest repositories of biological data. Universally, states are the responsible authorities for managing fish and wildlife resources. This special edition of *Access* features articles highlighting NBII successes in developing partnerships and working with state fish and wildlife agencies.

In one article, Andy Loftus, a long-time conservation data manager, details preliminary findings from the National Fish and Wildlife Database Summit. The NBII and the U.S. Fish and Wildlife Service sponsored the Summit, which was hosted by the Organization of Fish and Wildlife Information Managers. Three additional *Access* articles feature NBII partnerships with state fish and wildlife agencies and how the NBII successfully serves the resources management community through projects that address clear conservation needs – cost-effectively.

A series of focus groups and planning meetings were conducted with state fish and wildlife agencies during the first year of the International Association of Fish and Wildlife Agencies (IAFWA)/NBII partnership. The needs of the participants, repeated in the meetings, can be distilled into two

(continued on page 5)

States and the NBII Collaborate to Improve Data Sharing

In early November 2002, representatives from 31 state agencies, 13 NGOs, and 4 federal agencies met at the National Fish and Wildlife Database Summit to explore improved interagency information exchange. The Summit was designed to solicit ideas for improving collaboration between states and the NBII and to develop components of a strategic plan for information sharing.

The poster session proved popular for numerous Database Summit attendees.

"From the input that I heard at the Summit, the NBII will not only have material for developing a national level strategic plan for working with the states over the long run, but will also have enough material to begin working immediately to resolve regional information sharing needs," remarked Jake Faibisch, NBII Coordinator for the International Association of Fish and Wildlife Agencies.

(continued on page 4)

In This Issue

CSWGCIN and Texas Parks and Wildlife: Partners in Environmental Review

Running from Mexico to Canada, straight through America's heartland, the NAFTA Highway will cross more than 1,000 miles of Texas – from Brownsville to Texarkana. The project is named after the North American Free Trade Agreement (NAFTA), and like any large highway project the environmental review process is daunting.

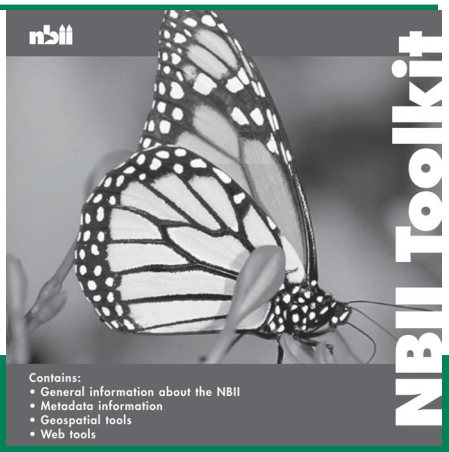
The highway is an enormous undertaking, both geographically and financially; it will cover more than 400 USGS quad maps. Like virtually all highway construction projects, environmental review is a critical part of the project, and quality data is a prerequisite for project success.

Numerous contractors will provide environmental review, and they all must use consistent data. Texas Parks and Wildlife (TPW) Department has the best wildlife-related data in the state, and most importantly, TPW holds vital data on threatened and endangered species locations. The data are mostly, if not entirely, on paper maps.

The NBII Central Southwest/ Gulf Coast Information Node (CSWGCIN) provided approximately 3 months of technician time to TPW to digitize threatened and endangered species data that had been handwritten on quad maps. Texas Parks and Wildlife provided quality control/ quality assurance. The partnership resulted in broadly applicable, GIS-compatible data sets valued by TPW and the environmental reviewers. Additionally, the data are now in a format enabling other analyses that further increase the value of the data sets.

These data are now ready and available for future environmental

(continued on page 12)



NBII CD-ROM Toolkit Now Available

Now, everything you wanted to know about the NBII is available in one neatly packaged CD-ROM.

The recently released NBII Toolkit contains information and tools related to the NBII and associated biological informatics programs. The toolkit is designed to educate NBII partners and customers about the NBII and its capabilities. It also provides a basic set of tools, graphics, and standards that the NBII Program currently supports and uses. The toolkit is available to all NBII partners and customers.

For a copy of the NBII Toolkit, just contact Ron Sepic by phone 703-648-4218) or e-mail <ron_sepic@usgs.gov>.

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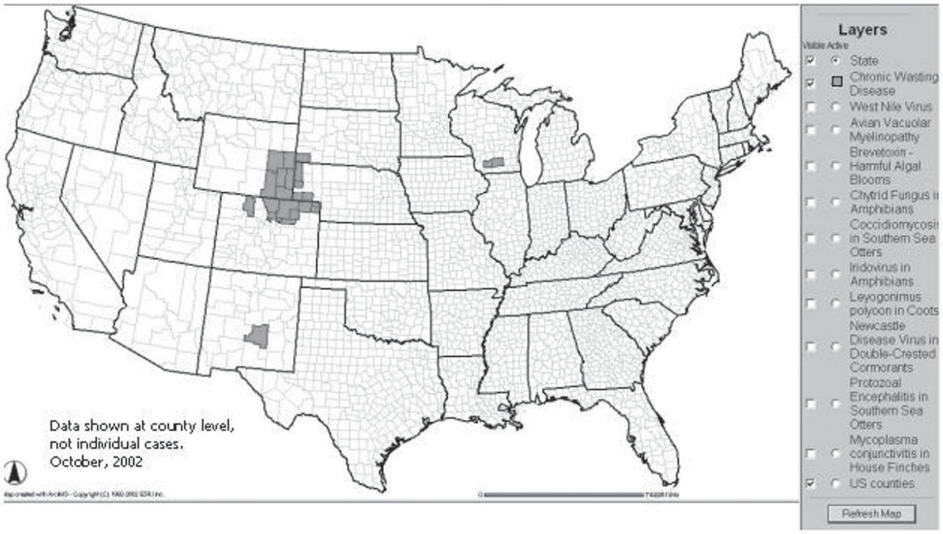
Chronic Wasting Disease Data Integration and Management through the Wildlife Disease Information Node

Chronic Wasting Disease (CWD) has gained much attention in the past few months (see news headlines at right), and may indeed be the highest profile issue facing state fish and wildlife agencies today. In fact, CWD is one of the top priorities within state fish and wildlife agencies, and the federal government has been asked by Congress to assist state agencies with this problem. CWD is in a class of diseases known as transmissible spongiform encephalopathies (TSEs), diseases of the nervous system that result in distinctive lesions in the brain and are believed to be caused by modified proteins called prions. CWD has been shown to affect elk, white-tailed deer, and mule deer in both captive and wild populations, and at present is not known to affect livestock or humans. Although CWD has been gaining momentum in its visibility, especially with the identification of the disease in Wisconsin, Minnesota, and Illinois, not much is yet known about this disease, including its origin and transmission pathways.

Through the NBII Wildlife Disease Information Node (WDIN), located at the USGS National Wildlife Health Center in Madison, WI, data integration and information management needs on CWD will be made possible. WDIN will offer an effective mechanism for providing access to comprehensive, Internet-based CWD information in a secure, partner-based data system <http://wildlifedisease.nbii.gov>. The WDIN's data system was endorsed by state and federal representatives in the National CWD Implementation Plan as the site for "one-stop shopping" for scientific, technical, and geospatial CWD information. It is being designed to handle mapping capabilities for CWD positive and negative brain tissue samples to help identify and analyze disease distribution patterns on a national basis and to make accessible near real-time comprehensive data on CWD. Wildlife managers, disease specialists, and other interested groups will greatly benefit from WDIN's common access to important CWD information, including available test results, Geographic Information System (GIS) analyses of CWD patterns, and predicted areas of potential risk.

Infected mule deer with CWD (Photo credit: Christina Sigurdson, Colorado State University)



Screenshot of county-level geospatial CWD disease data for wild cervids; map available through the Wildlife Disease Information Node: <http://wildlifedisease.nbii.gov>.

A grant awarded through an IAFWA Multi-state Conservation Grant program to the Conservation Management Institute (CMI) at Virginia Polytechnic Institute will assist state fish and wildlife agencies to develop data standards and transfer mechanisms to facilitate inclusion and access of their state data in the WDIN's national CWD electronic information clearinghouse. The WDIN is working with the IAFWA Wildlife Health Task Force and CMI to ensure that the wildlife disease database supports its state partners' efforts to manage CWD and, eventually, other wildlife diseases.

States and the NBII Collaborate to Improve Data Sharing
(continued from page 1)

During the Summit, the participants provided input through facilitated workgroups. The workgroups were broken into areas designed around the data management needs of the fish and wildlife management community. The workgroup participants brainstormed top data management issues that they face within their own states and identified their interstate data sharing needs. Ultimately, the groups formulated action plans to overcome obstacles to sharing data as they work on resource management issues.

Abby Compton, Atlantic Coastal Cooperative Statistics Program, and Cedric Cooney, Oregon Department of Fish and Wildlife, participate in one of the Summit breakout sessions.

The response from the Summit participants was tremendous, and the breadth of input provided solid recommendations for action at both the state and federal levels. The summary of recommendations, below, only represents a small portion of the input received during the Summit. Thoughts about specific opportunities that currently exist to improve data sharing were also expressed. All have been included in a final report that is now available on the IAFWA, OFWIM, and NBII sites.

Key recommendations include:

Improve communication between state and federal agencies: Since states generally do not have mandates for interagency data exchange, requests from outside agencies that do not directly impact the state constituencies are often given lower priority. In addition, some participants cited a prevailing "paranoia about data sharing" that has developed due to lack of communication/understanding about the uses of shared data.

Provide incentives for data sharing: Although the benefits of collaborating on information exchange projects can be tremendous, they are often not highly visible to administrators or the public. Quite often, incentives such as financial, technical, or programmatic support can provide the mechanism to initiate new information exchange projects and leverage additional support from agencies.

Outline legal and agency policy regarding data exchange: Many agencies have not investigated and clarified their legal obligations and mandates for making mass quantities of information available electronically. Further, some conflicting interpretations of laws such as the Freedom of Information Act have left information managers uncertain about these issues. An initiative should be developed to clarify these issues and potentially clear this hurdle.

Formulate data standards: Data standards may vary with the intent of each information sharing project. However, some basic guidelines for data standards should be developed to assist information managers in developing protocols and classifying their data.

Stabilize and improve funding: Traditionally, fisheries and wildlife information systems have lacked adequate funding and long-term financial plans to adequately support them. In the long run, improved information management should reduce financial burdens to agencies by improving efficiencies. Lack of a stable funding for information management programs has meant that requests from outside agencies for data add additional burdens on agency budgets that are often not met.

Restructure the role of data management professionals within agencies: Commonly, today's data management professionals evolved from other areas of technical expertise within agencies, such as biologists. With hybrid professionals working on data systems, it was emphasized that investments in continuing education and training needed to be made to ensure that data management skills remained up-to-date. When personnel specifically trained in data management are employed by agencies, they are often removed from the program area where they are most needed (i.e., fisheries, wildlife, and so forth) and placed in overarching "IT" divisions serving a variety of customers. Emphasis needs to be placed on integrating these professionals directly with the customers (i.e., divisions) that they serve, and providing pay/promotional opportunities commensurate with skills to retain them within the agencies.

Improve agency leadership: The importance of strong leadership and promotion of the importance of data management from agency directors and upper management pervaded through many of the suggestions. In addition to a strong information management strategic plan, adequate funding and clear direction were cited as needs. At the federal level, this may mean clearly delineating the purposes behind requests to state agencies to participate more actively in information sharing projects. For state agencies, this direction included the need for stronger support for information management/sharing programs by agency administrators.

Sage Grouse Conservation and Data Management

To many, the American West is embodied by the open range – you know, where the deer and the antelope play. This is sagebrush habitat – wide open space as far as the eye can see. This is also home of the sage grouse, a fascinating bird that depends on healthy sage brush for its existence.

In some ways, the sage grouse is like the "canary in the coal mine" for sagebrush habitats because the bird populations are so closely tied to the sage. Sage grouse populations are declining, to the alarm of wildlife managers, and their decline is a direct result of sagebrush habitat decline and loss. As sage grouse decline, they teeter ever closer to listing as threatened under the Endangered Species Act, a decline that partners, universally, want to see reversed.

The U.S. Geological Survey (USGS) in partnership with the Bureau of Land Management (BLM) provides access to maps of sagebrush habitats and sagebrush distribution through the SAGEMAP project, headquartered at the USGS Snake River Field Station in Boise, ID.

Through matching funds provided by the NBII and the IAFWA Multi-state Conservation Grants program, a technician will be located in Salt Lake City, UT, to work with state fish and wildlife agencies to integrate sage grouse population, distribution, and harvest data with the sagebrush habitat map layers already supported by SAGEMAP.

The Sage Grouse Conservation Framework Planning Team was created through a Memorandum of Understanding (MOU) among the Western Association of Fish and Wildlife Agencies, US Forest Service, US Fish and Wildlife Service, and the BLM. The information assembled under this project will support the conservation management needs of the MOU signatories, as well as provide the best data possible for conservation planners.

The SAGEMAP partnership with the NBII exemplifies how the Internet can enable access to important data and enhance conservation management efforts.

The project is scheduled to begin in midwinter 2003, and will last for a year.

Peterson Retires

On December 13, 2002, R. Max Peterson retired as Executive Vice President of IAFWA. After more than 13 years of leading IAFWA, Max leaves behind a remarkable legacy that includes a history of support for the NBII.

Max played an important role in supporting the NBII's first successful appropriations, and he has been an important source of guidance to the NBII over the years.

Max has been recognized by many leading conservation organizations for his untiring work in support of conservation, and he will be missed.

Following a month-long transition, John Baughman now serves in IAFWA's top post. John is a former director of the Wyoming Game and Fish Department.

NBII and State Fish and Wildlife Agencies — Working Together
(continued from page 1)

simple statements. Successful data management projects:

- Meet a clearly-defined conservation need; and
- Are cost-effective.

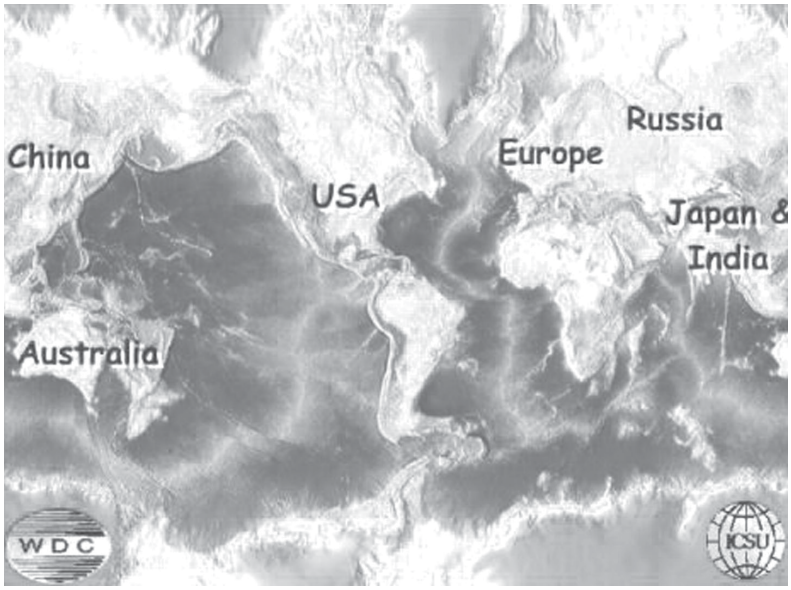
These two simple statements provide an important framework for measuring project success when addressing wildlife and fisheries managers.

The NBII projects in the accompanying articles exemplify the potential of the NBII to address critical conservation issues. The projects are drawn from the spectrum of the NBII community: thematic, regional, and provisional projects are included. It is important to note that two of the projects were facilitated through the IAFWA/NBII partnership, while the work conducted by the NBII Central Southwest/Gulf Coast Information Node and the Texas Parks and Wildlife Department applied the two-part model for success independent of the IAFWA.

The IAFWA/NBII partnership is well into its second year, and projects are planned and underway that will greatly benefit natural resources conservation. Using the two simple criteria mentioned above, success can be measured. The NBII has provided the infrastructure necessary to meet critical conservation needs valued by wide ranging partners.

NBII Named First World Data Center for Biodiversity and Terrestrial Ecology

The International Council for Sciences (ICSU) Panel on World Data Centers has recognized the National Biological Information Infrastructure (NBII) as the first World Data Center for Biodiversity and Terrestrial Ecology. This designation gives the NBII the opportunity to disseminate its biodiversity and ecology information on a global platform. The NBII's critical partnerships and regional information nodes will enhance the international exchange of biological and ecological scientific data in the World Data Centers network. The NBII <www.nbii.gov> is a broad-based, collaborative program among federal, state, international, non-government, academic, and private industry partners. Together, they provide increased access to data and information on the nation's biological resources.



The National Academy of Science (NAS) Committee on Geophysical and Environmental Data's site-visit team recommended the NBII's designation as a World Data Center for Biodiversity and Terrestrial Ecology to the ICSU Panel on World Data Centers. The Panel oversees nearly 50 World Data Centers (WDCs), which are maintained by their host countries and are responsible for collecting, archiving, and distributing a wide range of data. These data cover time-scales ranging from seconds to millennia and provide baseline information for research in many disciplines, especially for monitoring changes in the geosphere and biosphere – gradual or sudden, foreseen or unexpected, natural or man-made. The WDC System is comprised of Data Centers in Russia, Europe, Japan, India, China, the United States, and Australia.

There are 14 WDCs and a Coordination Office situated in the United States. The Coordination Office is managed by the U.S. NAS through its Committee on Geophysical and Environmental Data and provides U.S. Data Centers representation on the ICSU Panel. The Coordination Office also facilitates visits and other activities that are common to the WDC discipline centers located in the United States.

In May 2001, the USGS Center for Biological Informatics (CBI) proposed establishing the NBII as the WDC for Biodiversity and Terrestrial Ecology and, in June 2002, hosted a formal review by the NAS site-visit team. CBI proposed operating the WDC for Biodiversity and Terrestrial Ecology for the benefit of the international scientific community and according to ICSU principles and procedures for World Data Centers. The USGS Director, Dr. Charles Groat, endorsed the proposal and in his letter to the NAS, said "USGS is pleased to have the opportunity to share these resources with the world community through the WDC Network."

The NAS site-visit team unanimously determined that the NBII meets ICSU criteria for participation in the WDC System and enthusiastically recommended to the Panel that they designate the Data Center. With the designation of the WDC for Biodiversity and Terrestrial Ecology, the USGS now operates four WDCs. The oldest is the WDC for Seismology that is operated by, and collocated with, the National Earthquake Information Service in Golden, Colorado. The second is the WDC for Remotely Sensed Land Data, operated by, and collocated with, the EROS Data Center in Sioux Falls, South Dakota. This past year the Sioux Falls EROS Data Center was approved as the WDC of Land Cover Data.

The NBII works with its partners to link diverse, high-quality biological databases, regional information nodes, and analytical tools maintained by partners and other contributors in government agencies, academic institutions, non-government organizations, and private industry. NBII partners and collaborators also work on new standards, tools, and technologies that make it easier to find, locate, integrate, and apply biodiversity and ecology information. Resource managers, scientists, and the general public use the NBII to answer a wide range of questions related to the management, use, or conservation of biological resources. The designation as a World Data Center will enable the NBII and its partners to deepen the reach of their biological and ecological information around the world.

Biocomplexity Information Node Awarded 3-Year Contract

The Biocomplexity Collection is a government/private industry partnership between the NBII and CSA, a leading producer of bibliographic citation databases and Web resources databases. The Biocomplexity Collection was first featured in the Summer 2001 issue of *Access* (*"Partners in the Spotlight"*).

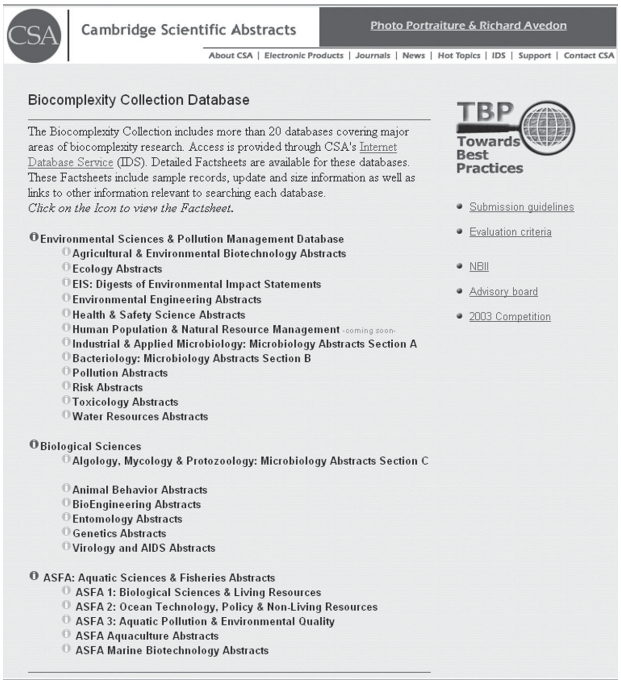
The original partnership was a 20-month (March 1, 2001 through October 31, 2002) cooperative agreement (CA). Subsequently, CSA was awarded a 3-year (November 1, 2002 through October 31, 2005) contract to continue and expand upon its work with the NBII.

Under the terms of the original CA, CSA delivered to the NBII:

- Over 75,000 bibliographic citations drawn from the biological, environmental, human population, and aquatic sciences;
- More than 11,000 expert selected and indexed Web site records from the same four fields;
- A brand-new bibliographic citation database titled "Human Population and Natural Resource Management" (HP&NRM) created from scratch specifically for the Partnership; and
- The extensive Biocomplexity Thesaurus to be used for indexing, metadata, and searching purposes by CSA, USGS, the NBII and its nodes and partners, and the public-at-large.

Over the course of the new contract, CSA will continue to deliver biocomplexity-relevant bibliographic citations, Web sites, and HP&NRM records to the Biocomplexity Collection. Additionally, CSA will:

- Create a database of biocomplexity and conservation-pertinent best practices, tools, and techniques referred to as Towards Best Practices (TBP). TBPs will be presented on the NBII portal as an electronic forum *(see accompanying announcement on this page)*. This interactive eForum will facilitate the rapid, far-reaching distribution and discussion of techniques and practices that work in the real world.
- Develop and operate a pre-print e-Journal for the NBII, its nodes, and their partners.
- Create the Center for Ecotourism Science (CES). The CES will be a Web-based clearinghouse for data and information on the technical and scientific underpinnings of ecotourism. As such, the CES will be an invaluable practical resource to all parties involved with contemplating,planning, developing, sustaining, and managing ecotourism ventures.
- Quarterly update and maintain the Biocomplexity Thesaurus.



Announcing Towards Best Practices: An eForum on Biocomplexity and Conservation

CSA, in partnership with the NBII, announces the debut of Towards Best Practices (TBP), an interactive electronic forum (eForum) to foster discussion and disseminate examples of sound conservation and resource management practices. TBP will be developed by and written for scientists, natural resources managers, and policymakers engaged in the study or management of complex interactions between life forms – including human populations – and the environment.

CSA will solicit reports of science-based practices beginning in early 2003. All submissions will be reviewed by an Advisory Board and evaluated on the qualities of transferability, innovation, conservation impact, durability, and instructional potential. All qualifying entries will be posted on the NBII eForum as a dynamic publication, where the work may be reviewed, discussed, and tested in an open, public, electronic community forum.

More details are available at <http://www.nbii.gov/datainfo/bestpractices/index.html>.

NBII Highlighted in Performance-Based E-Government Publication

A recently released report from the Performance Institute – titled *Creating a Performance-Based Electronic Government* – features the NBII as an example of how citizen-centered E-Government initiatives in federal agencies are employing information technology to enhance the value of information for their users. The NBII is referred to as "the nation's living library," providing reliable scientific information to scientists, planners, educators, policy-, law-, and decision-makers, and the general public.

The President's Management Agenda identifies and describes five key government-wide initiatives. Chief among them is Citizen-Centered Electronic Government, designed to focus on the "use of the Internet to empower citizens, allowing them to request customized information from their government when they need it, not just when the government wants to give it to them." The *Creating a Performance-Based Electronic Government* report presents research on the progress being made by federal agencies as they seek to define and measure their E-Government initiatives. It provides a comprehensive catalogue of citizen-centered initiatives in each agency along with key lessons learned from each. The NBII is praised in the report for typifying "the E-Government concepts outlined in the President's Management Agenda. Moreover, a citizen-centered emphasis is entirely consistent with the NBII's history, mission, and current activities."

The E-Government report was officially released at a ceremony at the National Press Club on October 30, 2002. Mark Forman from the Office of Management and Budget opened the ceremony with a talk on the "State-of-the-Practice in E-Government." Kate Kase, NBII Program Manager, represented the NBII at the ceremony. She commented: "The NBII is a critical contributor to the Department of the Interior goal of Serving Communities, as we focus on using the best, fastest, and most efficient way to deliver services and information to citizens. The NBII makes as much information accessible as possible on natural resources, biodiversity, and the environment and supports science-based decision-making at all levels."

Moving forward, Kase says the NBII will continue to support the goals of performance-based E-Government by partnering with more organizations from all sectors to offer more biodiversity data, information, and tools online. A key E-Government strength of the NBII is that, besides making data and information available over the Internet, it goes beyond the functions of a typical Web site. "Our long-term E-Government objectives are to improve functionality by providing continuous data discovery, archiving, and serving; supporting virtual workspaces for communities through our portal, My.NBII.Gov; offering enterprise-wide analysis and synthesis tools for modeling and visualization (including training on how to use those tools); and most importantly, continuing to work toward the goal of interoperability so that users may combine data from disparate sources in meaningful ways," she says.

Performance-based E-Government publication identifies ten key themes from current E-Government initiatives:

1. The administration and the Office of Management and Budget are cited for their strong leadership of E-Government initiatives, though some improvements are needed.

2. Agencies generally fail to use mission-aligned IT performance measures to justify, manage, and evaluate the success of E-Government.

3. Agencies need to become more creative and willing to "blow up" old program structures with technology.

4. Non-governmental intermediaries are providing greater opportunities to borrow rather than build an E-Government solution.

5. E-Government is increasingly focusing on the citizen again, but not all E-Government initiatives are "Citizen-Centered."

6. CIOs are assuming an appropriate role of "enabler" of agency business processes and are more integrated with the rest of the agency's leadership.

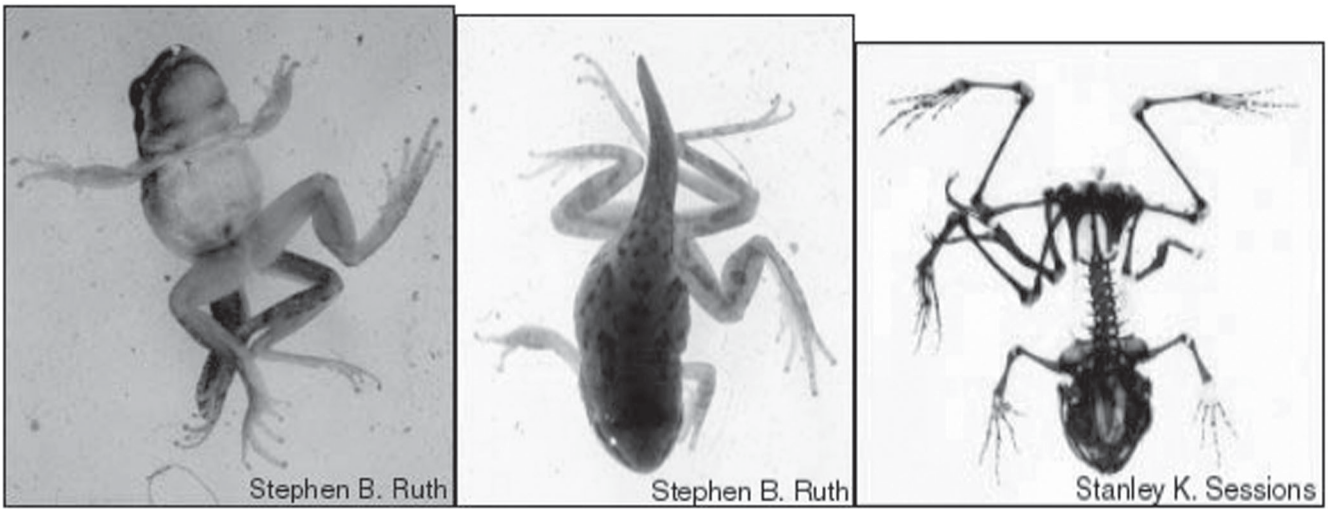
7. More program managers are playing leadership roles in E-Government, but more needs to be done to engage all program managers in E-Government leadership roles.

8. Excellent cross-agency coordination is seen in the priority E-Government initiatives, but stove-piped systems and processes remain an obstacle to an integrated E-Government.

9. The Federal Enterprise Architecture is recognized as the necessary, but missing, scaffolding for all agency E-Government initiatives.

10. Establishing clear priorities is paying off in generating attention to and sufficient funding for key E-Government initiatives.

NARCAM Taken Over by the NBII



*Examples of malformed Pacific treefrogs (*Pseudacris regilla*)*

The NBII is now running the North American Reporting Center for Amphibian Malformations (NARCAM). A few years back, the U.S. Geological Survey's Northern Prairie Wildlife Research Center (NPWRC), in combination with some partners, started this online amphibian malformation system to facilitate the transfer of information on malformed amphibians. By compiling information from both the public and the scientific community, the objective has been to convey an accurate account of this phenomenon and accelerate investigations. NARCAM is also designed to encourage further collaboration among scientists to understand the cause(s) of amphibian malformations in the wild.

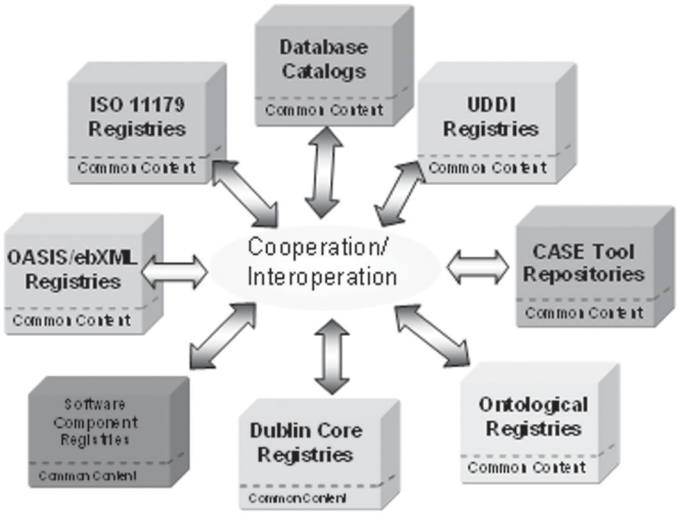
The value of this reporting center has long been recognized by the NBII. When the NPWRC recently expressed that it could no longer run and maintain NARCAM, the NBII volunteered to take over the entire reporting system. Although the NARCAM files have been moved to new servers at the NBII, the reporting mechanism and other database aspects are being revamped to make improvements to facilitate data collection, verification, and reporting. The NBII will collaborate with partners to design tools and models that people can use to interact with the data, possibly including an ArcIMS interface to view malformation incidents geographically. Additionally, the NBII is in the process of getting a herpetologist on board to verify data submitted to NARCAM.

To date, NARCAM has received over 2,100 reports from 1,032 sites encompassing 82 species of amphibians. Of these, there are 944 reports with verifiable cases of malformations involving 52 species in 46 states and 4 provinces. In the summer of 1995, middle school students on a field trip to a farm pond in southern Minnesota discovered large numbers of frogs with misshapen, extra, or missing limbs. About 50% of the northern leopard frogs they caught that day were malformed. Since then, there has been a dramatic increase in reports of malformed amphibians in North America. However, malformations seem to be concentrated in a few core species, with the northern leopard frog (*Rana pipiens*) being most commonly reported (30.1% of all reports of malformations). Reports of malformed green frogs (*R. clamitans*), American bullfrogs (*R. catesbeiana*) and Pacific treefrogs (*Pseudacris regilla*) are fairly frequent as well (13.1%, 10.0%, and 9.3% respectively of all reports), and these four species plus an additional six (*Bufo americanus*, *R. sylvatica*, *Hyla chrysoscelis* & *versicolor*, *R. septentrionalis* and *B. boreas*) account for 77.8% of all reports. Also, while 78.8% of all reported species showing malformations were anuran amphibians, anurans accounted for 94.1% of these reports.

Although historical records on amphibian populations are limited, the records that exist suggest that the observation of malformations in amphibians is not a new phenomenon. Nevertheless, observations from researchers and collectors who have been working with amphibians for many years, and a growing number of multi-year studies, indicate that malformations may be an unusual and recent phenomenon in parts of the United States and Canada. While some controversy exists over the extent to which these malformations occur naturally in healthy populations, scientists agree that current numbers of reported malformations are in excess of what is likely to be normal, and that the situation warrants urgent attention. The wide geographic distribution and the variety of amphibian malformations are a growing concern to resource managers, research scientists, and public health officials.

Open Forum on Metadata Registries Highlights the Biological Information Infrastructure

Several hundred people attended the 6th International Open Forum on Metadata Registries in Santa Fe, New Mexico, on January 20-24, 2003. Metadata registries are resources that allow metadata schema and elements to be well-documented for re-use, mapping, and more automated processing when trying to integrate or interoperate data within or across enterprises. This year's program included a special Environmental Sub-track on Biological Information Infrastructures. The NBII supported the development of the conference program.



A plenary presentation by Gladys Cotter, USGS Associate Chief Biologist for Information, highlighted the importance to environmental decision-making of interoperability through standards in metadata, content, and terminology. Also on the plenary platform was Ramona Trovato, Deputy Assistant Administrator for the Office of Environmental Information, U.S. Environmental Protection Agency, and Gordon McInnis and David Stanners of the European Environment Agency. All three presentations emphasized ecological and biological informatics and the importance of establishing partnerships to address the development of standards and appropriate technologies.

The Biological Information Infrastructure Subtrack, on January 22-23, included presentations by many NBII partners including the Global Biodiversity Information Facility, Species 2000, the Integrated Taxonomic Information System, and the Long Term Ecological Research Network. Donna Roy from the USGS Center for Biological Informatics described the development of a portal to enhance communication among NBII nodes and communities of interest. Jessica Milstead, consultant to CSA, described how the Biocomplexity Thesaurus was built by integrating terminologies from various subject areas.

In addition to their subject-specific tracks, members of the environmental and biological communities had the opportunity to learn about metadata and standards developments in other disciplines, including defense, aerospace, and healthcare. Tutorials on a number of existing and developing standards, including the ISO 11179 standard for data element registries, were conducted on January 20-21, preparing "novices" and "techies" with the background on the standards that were discussed during the application tracks.

NBII Invasive Species Information Node Now Live

The NBII Invasive Species Information Node (ISIN), the central repository for invasive species information, has launched its initial phase at <http://invasivespecies.nbii.gov>. Featuring projects and content from NBII partners and regional NBII nodes that emphasize the invasive species issue, the ISIN is designed to provide information for land managers, decision-makers, and the general public to combat the negative effects of invasive species on the environment.

*Introduced to North America from Europe by early settlers for medicinal use, garlic mustard (*Alliaria petiolata*) has prolific seed production and lack of natural predators, which allow this invasive species to quickly dominate ground cover and crowd out native American herbs.*

Introducing the New NBII Metadata Program Coordinator

Recently the NBII Metadata Program underwent a shift in program coordination, with Vivian Hutchison (Viv) accepting the role of NBII Metadata Program Coordinator. She plans to carry on the success of the program established by the previous coordinators, Sharon Shin and Jen Gaines.

Viv Hutchison

There are currently five aspects of the Metadata Program that Viv is coordinating: training, creation assistance, quality control, clearinghouse activities, and program management.

Training: The NBII assists nodes and node partners in metadata creation by offering training in the Federal Geographic Data Committee (FGDC) standard and the Biological Data Profile. Details about the program can be found on the Web at <http://www.nbii.gov/datainfo/metadata/training/index.html>.

Creation Assistance: The NBII recognizes the fact that there are a plethora of biological data sets in existence that need metadata in order to be useful as resources. The NBII has an established contract with an experienced and talented metadata creator who is working to help NBII nodes, node partners, and USGS Biological Resources Discipline science centers stay on top of their metadata creation needs. Contact Viv at <vhutchison@usgs.gov> to inquire about this service.

Quality Control: The NBII has an excellent quality control process in place to check completed records before they are uploaded to the Clearinghouse. The USGS Fort Collins Science Center (FORT) analyzes each record for correct formatting and contacts the metadata creator to suggest any necessary adjustments. The record is then uploaded to the Clearinghouse Principal Node.

Clearinghouse: A Clearinghouse is a digital catalog for searchable metadata records. This is an invaluable resource for scientists and conservation decision-makers. The NBII Clearinghouse contains thousands of records. Instructions for uploading a record to the NBII Clearinghouse Principal Node can be found at <http://www.nbii.gov/datainfo/metadata/clearinghouse/submitting.html>. The submitted record will automatically pass through quality control at USGS FORT.

Program Management: The NBII Program Office is responsible for coordinating the components of the program listed above, in addition to incorporating new services and ideas into the program. Contact Viv with any questions you may have about the NBII Metadata Program:

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Metadata Program Services Update

Training: In the last year, many training courses were conducted across the country to teach the FGDC standard and the Biological Data Profile. Two "Train-the-Trainer" courses were also conducted, further enhancing the number of trainers throughout the country.

Metadata Creation Assistance: Through an ongoing interagency contract with NASA's Global Change Master Directory, the NBII assisted in the creation of 191 new records from 19 different partner agencies for the year 2001 to 2002.

Quality Control: In the past two years, 1,063 files were submitted to USGS FORT for quality control. These records were reviewed for quality before being uploaded to the NBII Clearinghouse Principal Node. The NBII believes quality control provides the biological community with the most comprehensive metadata records possible.

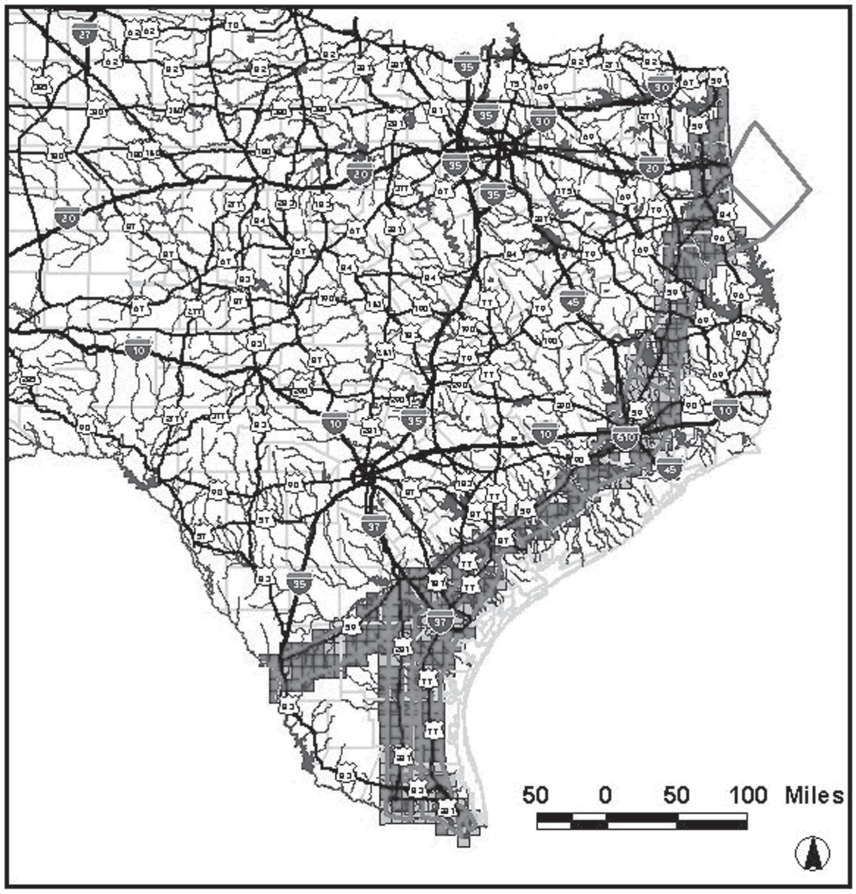
Clearinghouse: In the last year, an average of 350 searches were conducted on the Clearinghouse per month. The Principal Node of the Clearinghouse contains approximately 1,619 records, and that number is increasing. Other registered nodes on the Clearinghouse provide access to many additional records. The Clearinghouse has taken on a new look, as the interface was reconstructed to ease the search process. Oak Ridge National Laboratory, located in Oak Ridge, Tennessee, hosts the NBII Clearinghouse.

CSWGCIN and Texas Parks and Wildlife: Partners in Environmental Review *(continued from page 2)*

review needs. The Environmental Protection Agency requested the ability to incorporate Gap Analysis Program (GAP) data in the NAFTA Highway environmental review process, and now CSWGCIN and TPW can overlay GAP data with the threatened and endangered species data providing a more robust decision support mechanism. The GAP data and TPW threatened and endangered species data also will be combined to create predictive models so that planners can more effectively identify highway placements that minimize impacts on imperiled wildlife.

This project follows CSWGCIN's business plan and focuses on a regionally and nationally important project. Currently CSWGCIN and TPW are investigating digitizing threatened and endangered species data for other parts of Texas.

NAFTA Corridor Threatened and Endangered Species Digitization Project



NBII Map Services Registry Under Development

As a component of the ongoing development of National Biological Information Infrastructure (NBII) Geospatial Standards for Interoperability, work is currently underway to create a NBII Map Services Registry, which will support the data discovery of the NBII and other Federal Agency Internet mapping applications for NBII users.

There are two primary uses of the Map Services Registry. First, Internet search users looking for geographically referenced biological data and/or map services will benefit from the data contained in the central registry since the data will be searchable not only by NBII search engines, such as those in the NBII Metadata Clearinghouse, but will be exposed to external search engines such as Google through HTML/XML pages.

The metadata standard for these registry entries is based on the Dublin Core standard with additional NBII elements added. These metadata will contain information on the Internet mapping application as it pertains to the compilation of the individual layers, which is significantly different than the metadata required by the FGDC on the individual layers. This makes the content of the metadata very important, especially the keyword, common name, and scientific name fields that are additions to the Dublin Core standard.

Second, the Map Services Registry will serve as a source of data for dynamic access by all types of Internet mapping applications. Essentially, registering an individual map service within the registry will expose that map service to all other NBII Map services. The types of applications required to meet this standard will be documented within the NBII

(continued on page 16)

Exploring Species and Ecosystems Online: NBII Supports New Generation of Web Offerings

The home page to the redesigned NatureServe Web site serves as a jumping off point to a vast range of biodiversity data and information.

Two hundred years ago this summer, in July of 1803, young Meriwether Lewis left Washington, D.C., to begin his historic expedition to explore the then-unknown American West. Scientists and naturalists would soon marvel at the new information that Lewis and Clark brought back about the country's dazzling array of wild species and natural habitats. In our time, with America's wild places increasingly squeezed by habitat loss, information about our nation's plants, animals, and ecosystems is more precious — and more in demand — than ever. Now NatureServe, a conservation organization that is a leading source for information about rare and endangered species and threatened ecosystems, is helping to meet this demand through its completely redesigned Web site, thanks to support from the National Biological Information Infrastructure (NBII).

A key goal of the NBII-NatureServe partnership is to improve the online accessibility of species and ecosystem data held by NatureServe and its natural heritage member programs. The new Web site <www.natureserve.org> promises to be a major biodiversity information resource for those in the conservation, scientific, and education communities. The site includes the popular NatureServe Explorer Web product, a searchable database offering detailed information on more than 50,000 plants, animals, and ecological communities of the United States and Canada (including, of course, the many species first described by the explorers, such as Oregon bitterroot [*Lewisia rediviva*] and Clark's nutcracker). New enhancements to NatureServe Explorer include access to county and watershed distributions of more than 5,000 rare and endangered U.S. species — information never previously available online.

"NatureServe's new Web site organizes in one place our network's vast online data offerings, and represents a major contribution to the NBII's mission to improve online access to information about the country's biological resources," said Dr. Bruce Stein, NatureServe's Vice President for Programs.

*The new Web site includes NatureServe Explorer, which now provides county and watershed distributions for more than 5,000 at-risk U.S. species, including small-whorled pogonia (*Isotria medeoloides*).*

A Site for Biodiversity Insights

The site's development was spearheaded by Celia Najera-DiNicola, NatureServe's Web Manager and NBII Liaison. In addition to greatly improved graphic design and navigation, users exploring NatureServe's site will find a number of useful features:

- A portal to the online data offerings of the 76 natural heritage programs and conservation data centers in the United States, Canada, and Latin America that comprise the NatureServe network. These include numerous searchable biodiversity databases; local, state, and province-level data on at-risk species; and extensive information on ecological community classifications.
- Searchable databases providing conservation information for U.S. and Canadian plants, animals, and ecosystems (NatureServe Explorer) and for the birds and mammals of Latin America (InfoNatura).
- A monthly feature providing biodiversity insights

(continued on page 15)

IABIN Countries Report Wide Variety of I3N Benefits

September 30, 2002, marked the official end of the Inter-American Biodiversity Information Network (IABIN) Invasives Information Network (I3N) pilot effort, but the invasives activities initiated by seed grants from the U.S. State Department in 11 countries of the Americas* continue to bring a variety of benefits to the participants. The I3N pilot project called for participants to inventory existing invasive activities in their countries and to create and make available, via the Internet, catalogs of invading species names, projects, experts, and relevant data sets documented during the inventory.

The catalogs compiled by the participants are available either on the participants' Web sites or on the I3N Project Web site, <http://www.iabin-us.org/projects/i3n/i3n_project.html> (the Project Web site includes links to participants' Web sites). While the catalogs were the expected products of the project, the final reports from the participants listed a wide variety of additional benefits accruing during the effort, from the creation of the first listing in the country of species and specialists, to the discovery of possible invasive events, to the increased interest of the country's scientific community in invasive species.

Additional benefits due to leveraging were anticipated, but their nature and value could only be imagined until the project was under way. Andrea Grosse, I3N project manager for NBII, reported for example that one participant added to their collection of specimens of invading organisms; another created a photo collection. Jamaica produced an educational brochure on invasives (which credited the I3N project), and El Salvador developed species profiles/fact sheets. The information gathered contributed to the development of one country's national invasives strategy and provided a list of game and fish species that was annexed to a national biodiversity law of another. Capacity building, both human resources and information infrastructure, was a benefit reported by all.

Difficulties with the I3N Cataloguer, a software tool that exports local records as standardized XML, delayed realizing another objective of the project: to access the distributed databases in a uniform manner. However, NBII work continues to develop a single point access capability.

IABIN seeks to promote sustainable development and biodiversity conservation through the sharing of biodiversity information for decision-making and education among the countries of the Americas. More information about the project, including the final project report that lists all of the benefits reported by the participants, is available on the Web site at <http://www.iabin-us.org/projects/i3n/i3n_project.html>.

* *Argentina, Bahamas, Brazil, Chile, Dominican Republic, Ecuador, El Salvador, Guatemala, Jamaica, Mexico, and Paraguay.*

IABIN and CHM Plan Joint Meeting

Harmonizing the visions of IABIN and the Clearing-House Mechanism (CHM) of the Convention on Biological Diversity and jointly planning complementary activities that will support both initiatives will be the main items for discussion at a joint meeting of IABIN and the CHM, planned for early June 2003, in Cancun, Mexico. The meeting will serve as the CHM Regional Meeting for the Group of Latin America and the Caribbean (GRULAC) and the 3rd IABIN Council Meeting. The meeting planners expect that attendees will include official Focal Points for both the CHM and IABIN, as well as representatives of NGOs, academic institutions, and the private sector active in either network.

Upcoming Events of NBII Interest

Natural Resources Information Management Forum, Vancouver, Canada.	February 5-6
Weed Science Society of America 2003 Meeting, Jacksonville, FL.	February 9-12
American Association for the Advancement of Science 2003 Annual Meeting, Denver, CO.	February 13-18
International Workshop on Open Access and the Public Domain in Digital Data and Information for Science, Paris, France.	March 10-12
Computers in Libraries, Washington, DC.	March 12-14
Internet Librarian International, London, England.	March 17-19
Environmental Future of Aquatic Ecosystems, Zurich, Switzerland.	March 23-27
Information Highways 2003 Conference & Showcase, Toronto, Canada.	March 24-26
American Society for Environmental History 2003 Annual Meeting, Providence, RI.	March 26-30
National Science Teachers Association (NSTA), Philadelphia, PA.	March 27-30
Council of Planning Librarians Meeting, Denver, CO.	March 29 – April 2
Metadiversity III: Global Access for Biodiversity Through Integrated Systems, Philadelphia, PA.	March 31 – April 1
DTIC 2003 Annual Users Meeting and Training Conference, Arlington, VA.	March 31 – April 3
Natural Science and Public Health: Prescription for a Better Environment, Reston, VA.	April 1-3
18th Annual Symposium of the United States Regional Association of the International Association for Landscape Ecology, Banff Centre, Alberta, Canada.	April 2-6
4th National Integrated Pest Management Symposium, Indianapolis, IN.	April 8-10
Association of Southeastern Biologists 64th Annual Meeting, Washington, DC.	April 9-12
Saving Our Coastal Heritage: Restore America's Estuaries, Baltimore, MD.	April 13-16
Using Science to Assess Environmental Vulnerabilities, King of Prussia, PA.	May 13-15

Exploring Species and Ecosystems Online: NBII Supports New Generation of Web Offierings *(continued from page 13)*

and analyses through informative maps and charts. The first feature was a state-by-state view of U.S. species at risk.

• Technical details of NatureServe's standards and protocols for biological inventory and information management, including system diagrams and data dictionaries for the network's core data management software, Biotics.

• Access to ecological classification and mapping work, including the U.S. National Vegetation Classification System.

• A directory to the more than 800 staff working across the NatureServe network, with links to every natural heritage program home page.

NBII and NatureServe have a long history of working together. In 1995, the NBII helped The Nature Conservancy — NatureServe's precursor in this area — to establish an Internet presence for the network of natural heritage programs, including the first online directory of natural heritage program staff. Future goals include: 1) to maximize interoperability among NatureServe's data systems and resources and those of other NBII participants by sharing technology, best practices, and functional linkages; 2) to provide county and watershed distributions through an Internet map server that can be directly queried and downloaded; and 3) to build a distributed database architecture that allows streamlined online access to geospatial biodiversity data from across the NatureServe network. For anyone who follows in the spirit of Meriwether Lewis in seeking information about North America's wild species and native ecosystems, the NatureServe Web site is an excellent place to begin.

NBII Highlighted in Government Information Quarterly

The National Biological Information Infrastructure (NBII) <www.nbii.gov>, a Web-based system for providing information on the nation's biological resources, was highlighted in the final issue in 2002 of *Government Information Quarterly*, a cross-disciplinary, peer-reviewed journal that provides a forum for the examination of information issues at all levels of government.

The article, "The NBII as an E-Government Tool," explores the structure and operation of the NBII, which is coordinated by the USGS, in relation to several emerging trends in E-Government: end-user focus, defined and scalable milestones, public-private partnerships, alliances with stakeholders, and interagency cooperation.

NBII Map Services Registry Under Development

(continued from page 12)

Geospatial Standards for Inter-operability, but in general will be those that are persistent and not temporary in nature, and those that do not have proprietary or sensitive data that should not be exposed without control.

The use of a NBII Map Services Registry will both increase the overall visibility of NBII Internet Mapping applications, and allow interoperability across NBII Node and partner applications. The NBII Map Services Registry is slated for completion by June 2003. For more information about the Map Services Registry, please contact Donna Roy at <droy@usgs.gov> or 703-648-4209.

The NBII <www.nbii.gov> is a broad, collaborative program to provide increased access to data and information on the nation's biological resources. Coordinated by the U.S. Geological Survey, the NBII links diverse, high-quality biological databases, information products, and analytical tools maintained by NBII partners and other contributors in government agencies, academic institutions, non government organizations, and private industry. The NBII Program has developed a biological "profile" of the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata that can be used for documenting biological data and information of all types (see <http://www.nbii.gov/datainfo/metadata/standards/index.html>).

National Biological Information Infrastructure

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